REMARKS

The Office Action dated April 2, 2004, has been received and reviewed.

Claims 1-94 are currently pending in the above-referenced application. Claims 1-30, which have been considered, each stand rejected. Claims 31-94 have been withdrawn from consideration subject to a restriction requirement. Each of claims 31-94 has been canceled without prejudice or disclaimer.

Reconsideration of the above-referenced application is respectfully requested.

Claim Amendments

Each of claims 1-30 has been amended to replace each occurrence of the term "said" with the equivalent term "the." As these terms are equivalent to one another, none of these revisions alters the scope of any of claims 1-30.

Independent claim 13 has also been amended to replace the recitation "located and oriented adjacent a region on a backside of a semiconductor device structure assembled with [a] support structure . . ." with the broader recitation "located and oriented adjacent a region on a backside of a semiconductor device structure upon assembly of the semiconductor device structure with the support structure . . ." As this new language in independent claim 13 is broader than the prior language, it is respectfully submitted that amendment to independent claim 13 in no way narrows the scope thereof.

Independent claim 13 has also been amended to recite that each of the plurality of actuators is configured to *independently* bias a corresponding pressurization structure against the backside of a semiconductor device structure.

Rejections Under 35 U.S.C. § 102

Claims 1-21 and 27-30 stand rejected under 35 U.S.C. § 102(e) for reciting subject matter which is purportedly anticipated by the subject matter described in U.S. Patent 6,059,638 to Crevasse et al. (hereinafter "Crevasse") (Crevasse was not published more than a year before the filing date of the above-referenced application).

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single reference which qualifies as prior art under 35 U.S.C. § 102. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

Crevasse describes polishing apparatus that are configured to space ripples, or nonplanarities, which are formed in polishing pads as a wafer or other substrate is forced thereagainst, from the outer peripheries of wafers or other substrates during polishing thereof. In particular, Crevasse describes polishing apparatus that include carrier heads equipped with carrier rings, or retaining rings, and magnetic elements that are configured to apply a selected amount of force to the carrier rings and, thus to control the elevation of the carrier rings relative to a polishing pad.

As is well known in the art and clearly described by Crevasse, a carrier ring 120, 234 laterally surrounds the periphery of a wafers 170, 290 (*see* FIGs. 1-3) and cooperates with the remainder of a carrier head 110, 230 to hold the wafer 170, 290 in place over a polishing pad 240 during polishing (col. 4, lines 1-9).

A magnetic system associated with the carrier ring 234 and carrier head 230 is configured to repulsively move the carrier ring 234 downward onto the polishing pad 240 and, thus, to move a ripple within the polishing pad outward and away from the outer periphery of the wafer 290. Col. 5, lines 30-36; *see also* col. 1, lines 46-53.

In view of the foregoing, it is apparent that the description of Crevasse is in no way directed to pressurization structures that are configured to apply pressure to a back side of a semiconductor device structure.

Independent claim 1 is drawn to an apparatus for selectively applying different amounts of pressure to a plurality of locations on a backside of a semiconductor device structure. The apparatus of independent claim 1 includes, among other things, "a plurality of pressurization rings . . ." Each of the plurality of pressurization rings is configured "to apply pressure to a correspondingly annular region of the backside of the semiconductor device structure . . ."

Crevasse does not anticipate each and every element of independent claim 1.

Specifically, Crevasse lacks any express or inherent description that any part of the polishing apparatus described therein selectively applies different amounts of pressure to a plurality of locations on a backside of a semiconductor device structure.

Moreover, Crevasse does not expressly or inherently describe that the carrier ring 234 thereof is configured to apply pressure to a region of a backside of a wafer 290. Rather, the description of Crevasse is limited to a carrier ring 234 that surrounds the outer periphery of a wafer 290 (*see* FIGs. 2 and 3) and that is associated with a magnetic control system that is configured to force the carrier ring 234 against a polishing pad 240.

Further, the polishing apparatus described in Crevasse includes only one carrier ring 234. Thus, Crevasse does not expressly or inherently describe an apparatus that includes "a plurality of pressurization rings," as required by independent claim 1.

Crevasse similarly lacks any express or inherent description that the polishing apparatus described therein may include "a plurality of magnetic controllers," as recited in independent claim 1.

Therefore, under 35 U.S.C. § 102(e), independent claim 1 recites subject matter which is allowable over the subject matter disclosed in Crevasse.

Claims 2-12 are each allowable, among other reasons, for depending either directly or indirectly from claim 1, which is allowable.

Claim 4 is additionally allowable because the description of Crevasse is limited to a magnetic control system that includes elements that are positioned on a single side of a semiconductor device structure (*i.e.,* wafer 290).

Claim 5 is further allowable since Crevasse neither expressly nor inherently describes that the carrier ring 234 thereof may be *attracted* to a magnetic field. Rather, the description of Crevasse is limited to *repulsion* of magnets associated with the carrier ring 234 to achieve the desired level of pressurization.

Claim 6, which depends from claim 5, is also allowable because Crevasse does not expressly or inherently describe that the magnetic control system thereof may be "located so as to magnetically attract [a] corresponding one of [a] plurality of pressurization rings." Again, the

description of Crevasse is limited to use of *repulsive* magnetic forces to control the position of the carrier ring 234 thereof or the amount of force applied by the carrier ring 234.

Claim 7 depends from claim 6 and is additionally allowable since Crevasse includes no express or inherent description of attracting at least one pressurization ring against a backside of a semiconductor device structure.

Independent claim 13 is also drawn to an apparatus for selectively applying different amounts of pressure to a plurality of locations on a backside of a semiconductor device structure. The apparatus of independent claim 13 includes, among other things, "a plurality of independently moveable pressurization structures . . ." Upon assembly of a semiconductor device structure with a support structure of the apparatus, each of the pressurization structures is "located and oriented adjacent a region of the backside of [the] semiconductor device structure . . ."

Again, Crevasse includes no express or inherent description of an apparatus that selectively applies different amounts of pressure to a plurality of locations on a backside of a semiconductor device structure.

In addition, Crevass neither expressly nor inherently describes that the carrier ring 234 thereof is configured to apply pressure to a region of a backside of a wafer 290. Instead, Crevasse merely describes that the carrier ring 234 surrounds the outer periphery of a wafer 290 (*see* FIGs. 2 and 3) and is associated with a magnetic control system that is configured to force the carrier ring 234 against a polishing pad 240.

Moreover, Crevasse lacks any express or inherent description that the polishing apparatus disclosed therein may include more than one carrier ring 234, whereas independent claim 13 requires "a plurality of independently movable pressurization structures . . ."

Crevasse also lacks any express or inherent description that the polishing apparatus described therein may include "a plurality of magnetic controllers," as recited in independent claim 1.

Accordingly, under 35 U.S.C. § 102(e), independent claim 13 recites subject matter which is allowable over the subject matter disclosed in Crevasse.

Claims 14-21 and 27-30 are each allowable, among other reasons, for depending either directly or indirectly from claim 1, which is allowable.

Claim 17 is further allowable since Crevasse neither expressly nor inherently describes that the carrier ring 234 thereof may be *attracted* to a magnetic field. Rather, the description of Crevasse is limited to *repulsion* of magnets associated with the carrier ring 234 to achieve the desired level of pressurization.

Claim 19 is also allowable because Crevasse does not expressly or inherently describe that the magnetic control system thereof may be "oriented so as to attract [a] corresponding pressurization structure." Again, the description of Crevasse is limited to use of *repulsive* magnetic forces to control the position of the carrier ring 234 thereof or the amount of force applied by the carrier ring 234.

Claim 29 is further allowable because Crevasse does not expressly or inherently describe that the magnetic control system thereof "is located to pull [a] corresponding pressurization structure against the backside of [a] semiconductor device structure . . ."

In view of the foregoing, it is respectfully requested that the 35 U.S.C. § 102(e) rejections of claims 1-21 and 27-30 be withdrawn.

Rejections Under 35 U.S.C. § 103(a)

Claims 22-26 have been rejected under 35 U.S.C. § 103(a) for reciting subject matter which is allegedly unpatentable over the teachings of Crevasse, in view of the subject matter taught in U.S. Patent 6,056,632 to Mitchel et al. (hereinafter "Mitchel").

The standard for establishing and maintaining a rejection under 35 U.S.C. § 103(a) is set forth in M.P.E.P. § 706.02(j), which provides:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference

> or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Mitchel teaches a carrier head for a polishing apparatus. The carrier head of Mitchel is configured to apply *uniform* pressure over the entire area of a semiconductor wafer. Col. 2, lines 28-30.

Claims 22-26 are each allowable, among other reasons, for depending indirectly from claim 13, which is allowable.

It is also respectfully submitted that there are several additional reasons that a *prima facie* case of obviousness has not been established against any of claims 22-26.

First, it is respectfully submitted that Crevasse and Mitchel, taken either collectively or individually, do not teach or suggest each and every element of any of claims 22-26. In this regard, Crevasse and Mitchel both lack any teaching or suggestion of an apparatus that includes a plurality of independently movable pressurization structures that are configured to be located and oriented adjacent to corresponding regions on a backside of a semiconductor device structure, and of a plurality of associated actuators that are configured to independently bias the pressurization structures against the backside of the semiconductor device structure.

Further, with respect to claim 22, neither Crevasse nor Mitchel teaches or suggests that a vacuum may be used to control the position of structure that is configured to apply pressure to region of a backside of a semiconductor device structure.

In addition, Crevasse and Mitchel both lack any teaching or suggestion of a spring that biases a pressurization structure against a backside of a semiconductor device structure, as recited in claim 23.

Claim 25 is further allowable since Crevasse and Mitchel both lack any teaching or suggestion that a spring may be associated with a pressurization structure that is configured to apply pressure to a region of a backside of a semiconductor device structure.

Claim 26 also depends from claim 24 and is also allowable since Crevasse and Mitchel both lack any teaching or suggestion that a positive pressure may be used to independently bias pressurization structures against corresponding regions of the backside of a semiconductor device structure.

Second, it is respectfully submitted that one of ordinary skill in the art would have no reason to expect the combination of teachings from Crevasse and Mitchel to successfully result in the apparatus that are recited in claims 22-26. In particular, neither Crevasse nor Mitchel teaches or suggests a plurality of independently movable pressurization structures that are configured to be located and oriented adjacent to corresponding regions on a backside of a semiconductor device structure, or a plurality of associated actuators that are configured to independently bias the pressurization structures against the backside of the semiconductor device structure.

At most, one of ordinary skill in the art could only expect the vacuum retention system of Mitchel to be used to secure a wafer 290 to the carrier head 230 of Crevasse, while the pressurization system of Mitchel applies a uniform pressure to the backside of the wafer 290 and the carrier ring 234 of Crevasse, which surrounds the outer periphery of the wafer 290, is forced against a polishing pad 240.

Third, it is respectfully submitted that, in view of the deficiencies in the teachings of Crevasse and Mitchel, one of ordinary skill in the art would not have been motivated to combine their teachings in the manner that has been asserted.

For these reasons, it is respectfully submitted that a *prima facie* case of obviousness has not been established against any of claims 22-26 and requested that the 35 U.S.C. § 103(a) rejections of these claims be withdrawn.

CONCLUSION

It is respectfully submitted that each of claims 1-30 is allowable. An early notice of the allowability of each of these claims is respectfully solicited, as is an indication that the above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,

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